



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/486,864	06/08/2000	ISAO KAKUHARI	28569.5100	2403
20322	7590	09/16/2005	EXAMINER	
SNELL & WILMER ONE ARIZONA CENTER 400 EAST VAN BUREN PHOENIX, AZ 850040001			FAULK, DEVONA E	
			ART UNIT	PAPER NUMBER
			2644	

DATE MAILED: 09/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/486,864

Applicant(s)

KAKUHARI ET AL.

Examiner

Devona E. Faulk

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/24/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21,22,24-30 and 33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21,22,24,29,30 and 33 is/are rejected.
- 7) ☒ Claim(s) 25-28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 March 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 21,23,24, 29 and 30 have been considered but are moot in view of the new ground(s) of rejection. The applicant has amended the claims thus rendering the previous rejection and the art used moot.
2. Claims 1-20,23,31 and 32 are cancelled.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 21,24 and 29** are rejected under 35 U.S.C. 102(b) as being anticipated by Hayakawa (JP 06072253).

Regarding **claim 21**, Hayakawa discloses an on-vehicle sound-amplification apparatus (indoor sound system (Figure 1), comprising:

a dipole sound source (11, 12) (See abstract) provided in the vicinity of a position of a passenger wherein at least one acoustic radiation axis thereof is directed outwardly from a vehicle interior (Figure 1);

a signal processing means for amplifying an acoustic signal and then inputting an output thereof to the dipole sound source (digital signal processor (16) (Figure 2) that gives a predetermined signal to the power amplification which drives the loudspeaker (page 3, paragraph 29));

the dipole sound source (11,12) includes at least two loudspeakers wherein the at least two loudspeakers are arranged so that respective acoustic radiation planes thereof are directed opposite to each other (see abstract, inherent in to a dipole speaker); and

the signal processing means (16, Figure 2) variably controls a phase of an input to at least one of the loudspeakers included in the dipole sound source (the phase of the signal to each sound source changes with the signal processing means (page 2, paragraph 10)).

Regarding **claim 24**, Hayakawa further teaches that the dipole sound sources are each horn speakers (11a,11b; 12a,12b) (page 2, paragraph 24). The horn speakers read on "acoustic tubes" as claimed. It is inherent that the radiated sound is radiated by guidance along the horn speakers.

Regarding **claim 29**, Hayakawa teaches that the dipole sound sources are horn speakers (inherently have a bent shape).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayakawa (JP 06072253) in view of Weingartner (U.S. Patent 4,594,729).

Regarding **claim 22**, Hayakawa discloses an on-vehicle sound-amplification apparatus (indoor sound system (Figure 1), comprising:

a dipole sound source (11, 12) (See abstract) provided in the vicinity of a position of a passenger wherein at least one acoustic radiation axis thereof is directed outwardly from a vehicle interior;

a signal processing means for amplifying an acoustic signal and then inputting an output thereof to the dipole sound source (digital signal processor (16) (Figure 2) that gives a predetermined signal to the power amplification which drives the loudspeaker (page 3, paragraph 29));

Hayakawa fails to disclose a non-directional sound source provided in a vicinity of a center of the dipole sound source wherein an acoustic radiation thereof is driven to have an inverted phase from that of the acoustic radiation of the dipole sound source which is directed into the vehicle interior, wherein the output from the signal processing means is also input to the non-directional sound source.

Weingartner discloses reproduction of sound in a vehicle loudspeaker arrays with signal dependent radiation patterns and the concept of a speaker placed in a dipole setup (HLM) and a third speaker (TM, Figure 6). The third speaker, TM, is non-directional (column 4, lines 60-62). It would have been obvious to modify Hayakawa to include a non-directional sound source as taught by Weingartner in order to improve spatial impression.

7. **Claim 30** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayakawa (JP 06072253) in view of Dodge (U.S. Patent 4,460,061).

Claim 30 claims the on-vehicle sound-amplification apparatus of claim 29, wherein the at least two loudspeakers included in the dipole sound source are arranged so that an interval between the respective acoustic radiation planes included in the acoustic tubes of the loudspeakers is less than or equal to approximately $\frac{1}{2}$ of the wavelength of the reproduced sound.

Hayakawa fails to disclose the respective acoustic radiation planes included in the acoustic tubes of the loudspeaker s is less than or equal to approximately $\frac{1}{2}$ of the wavelength of the reproduced sound. Dodge discloses an apparatus of increasing the directivity of a sound source. He further teaches in Figure 1 of two sources spaced vertically by approximately $\frac{1}{2}$ (column1, lines 60-63; column 2, lines 18-34). Thus it would have been obvious to have the loudspeakers arranged as claimed in order to increase the signal intensity of the sound sources.

8. **Claim 33** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayakawa (JP 06072253) in view of Sharp (U.S. Patent 3,781,475).

Claim 33 claims the on-vehicle sound-amplification apparatus according to claim 21, the dipole sound source comprising an amplified sound source for radiating an amplified sound and a control sound source for radiating a control sound, wherein an acoustic plane of the control sound source are placed such that a difference between a phase of the amplified sound and a phase of the control sound at a desired frequency is substantially within 90° in a direction along a main axis of acoustic radiation of the amplified sound. Hayakawa fails to disclose wherein an acoustic plane of the control sound source are placed such that a difference between a phase of the

amplified sound and a phase of the control sound at a desired frequency is substantially within 90° in a direction along a main axis of acoustic radiation of the amplified sound. Sharp teaches of two speakers mounted in opposite directions (Figure 3; column 3, lines 10-12) having a phase difference of 90° (column 3, lines 14-23). Thus it would have been obvious to one of ordinary skill in the art at time of filing to have the sound sources mounted to have the phase difference as claimed in order to produce an asymmetrical sound radiation pattern.

Claim Objections

9. **Claims 25-28** objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 571-272-7515. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The central fax number has been

Art Unit: 2644

changed to 571-273-8300. Faxes sent to the old number, 703-872-9306, will be rerouted to the new number until September 15, 2005.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DEF


VIVIAN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600